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SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
08/855905	5/14/97	YAMANAKA et al.	443-17

EXAMINER	ART UNIT	PAPER NUMBER
Kruer	1773	10

DATE MAILED:

EXAMINER INTERVIEW SUMMARY RECORD

All participants (applicant, applicant's representative, PTO personnel):

(1) Kevin Kruer (3) _____

(2) George Kaplan (4) _____

Date of interview _____

Type: ☒ Telephonic ☐ Personal (copy is given to ☐ applicant ☐ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☒ No. If yes, brief description: _____

Agreement ☐ was reached with respect to some or all of the claims in question. ☒ was not reached.

Claims discussed: All, specifically proposed amendments

Identification of prior art discussed: Applied art; Ueda & Takashi

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: No agreement with regards to patentability was reached. Examiner considered applicant's proposed amendments and declaration data, but both would bring about NEW ISSUES. Neither was officially entered. Applicant argued claimed paper exhibited a drop in resistivity after washing and this was an unexpected result

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

Unless the paragraphs below have been checked to indicate to the contrary, A FORMAL WRITTEN RESPONSE TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW (e.g., items 1–7 on the reverse side of this form). If a response to the last Office action has already been filed, then applicant is given one month from this interview date to provide a statement of the substance of the interview.

☐ It is not necessary for applicant to provide a separate record of the substance of the interview.

☐ Since the examiner's interview summary above (including any attachments) reflects a complete response to each of the objections, rejections and requirements that may be present in the last Office action, and since the claims are now allowable, this completed form is considered to fulfill the response requirements of the last Office action.

Examiner's Signature

PTOL-413 (REV. 1-84)

ORIGINAL FOR INSERTION IN RIGHT HAND FLAP OF FILE WRAPPER

To: Examiner Kevin R. Kruer, Group Art Unit: 1773

From: George M. Kaplan

Subject: U.S. Appln. Ser. No. 08/855,905
(Attny. Docket No.: 443-17)
Proposal for Discussion During Forthcoming Telephone Interview.

MEMORANDUM

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(1) Proposed Amendments to Claims 3, 1 and new Claim 27

(2) Arguments in favor of Patentability

(3) Comparative testing to be presented in proposed Declaration with three accompanying tables.

Total Pages: 15 pages

Cancel Claims 21-26;

3. (Amended) [The] A synthetic paper [as claimed in claim 1,] which comprises a film obtained by oxidizing the surface of a film obtained by stretching a resin film comprising as the base material a resin composition comprising

100 parts by weight of resin components comprising

component A: a polypropylene resin in an amount of 55-90 wt%

component B: a polyetheresteramide containing aromatic rings which is derived from

component b1: a polyamide having a number-average molecular weight of from 200 to 5,000 and containing a carboxyl group at each end

component b2: an alkylene oxide adduct of bisphenol having a number-average molecular weight of from 300 to 5,000

5-40 wt%

component C: a polyamide resin 3-20 wt%

and

component D: at least one modified low-molecular weight polypropylene selected from the following components d1 to d3

1-20 wt%

component d1: an acid modified low-molecular weight polypropylene having a number average molecular weight of from 800 to 25,000 and an acid value of from 5 to 150,

component d2: a hydroxy modified low-molecular weight polypropylene having a number-average molecular weight of from 800 to 25,000 and a hydroxyl value of from 5 to 150,

component d3: an ester modified low-molecular weight polypropylene obtained by partly or wholly esterifying component d1 with a polyoxyalkylene compound and having a number-average molecular weight of from 1,000 to 28,000,

the total amount of all resin components being 100 wt%,

and

from 10 to 250 parts by weight of

component E: fine inorganic particles,

said stretching being conducted at a temperature lower than the melting point of the polypropylene resin as component A,

wherein the stretched resin film has a void content as

calculated using the following equation (1) of from 10 to 60%

$$\text{Void content (\%)} = \frac{\rho^{\circ} - \rho}{\rho^{\circ}} \times 100 \qquad (1)$$

ρ°: density of the unstretched film

ρ : density of the stretched film.

1. (Amended) A synthetic paper which comprises a film obtained by oxidizing the surface of a film obtained by stretching a resin film comprising as the base material a resin composition comprising

100 parts by weight of resin components comprising

component A: a polypropylene resin 55-90 wt%

component B: a polyetharesteramide containing aromatic rings which is derived from

component; b1: a polyamide having a number-average molecular weight of from 200 to 5,000 and containing a carboxyl group at each end

component b2: an alkylene oxide adduct of bisphenol having a number-average molecular weight of from 300 to 5,000

5-40 wt%

component C: a polyamide resin 3-20 wt%

and

component D: at least one modified low-molecular weight polypropylene selected from the following components d1 to d3

1-20 wt%

component dl: an acid modified low-molecular weight polypropylene having a number-average molecular weight of from 800 to 25,000 and an acid value of from 5 to 150,

component d2: a hydroxy modified low-molecular weight polypropylene having a number-average molecular weight of from 800 to 25,000 and a hydroxyl value of from 5 to 150,

component d3: an ester modified low-molecular weight polypropylene obtained by partly or wholly esterifying component dl with a polyoxyalkylene compound and having a number-average molecular weight of from 1,000 to 28,000,

the total amount of all resin components being 100 wt%,

and

from 10 to 250 parts by weight of

component E: fine inorganic particles,

said stretching being conducted at a temperature lower than the melting point of the polypropylene resin as component A_1

said stretching and oxidation of said stretched film generating ultrafine cracks on a surface of said stretched film through which component B as permanent antistatic agent appears. (Page 4, lines 20-25, Page 6, line 20-Page 7, line 3, and Page 21, lines 11-13)

27. The synthetic paper as claimed in claim 1, wherein components B, C, and D are elongated by the stretching into long particles (islands) or particles in Rugby ball form. (page 21, lines 22-24)

Relative term is this defined in Spec.? Do this defined

1) The present invention is intended for synthetic paper having excellent permanent antistatic properties and offset printability. In accordance with the present invention, a high-molecular weight permanent antistatic agent is incorporated in the surface layer of a synthetic paper which is then stretched to enhance the antistat effect. The use of such a high-molecular weight permanent antistatic agent makes it possible to prevent the drawbacks with the use of the prior art low-molecular weight antistatic agent, i.e., sticking of film to the molding roll due to bleeding to the surface of the film and stain on the molding roll during film molding, blocking due to surface sticking after film molding, poor adhesion of ink to the film during printing. Further, the high-molecular weight permanent antistatic agent doesn't dissolve in water required for offset printing and thus doesn't impair the antistat effect while the low-molecular weight antistatic agent dissolves in water to eliminate the antistat effect.

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2) Comparison with Ueda et al.: EP0613919A1 and US Patent 5,652,326 corresponding thereto concern an antistat effect-providing olefin resin composition to be used in the present application. However, Ueda et al. gives neither suggestion for the fact that an antistat effect-providing olefin resin composition can be oriented to form a film having an enhanced antistat effect nor disclosure of the evaluation of offset printability of synthetic paper made of such an antistat effect-providing olefin resin composition. The essence of the present application is to orient such an antistat effect-providing olefin resin composition in admixture with a filler for the purpose of preparing a synthetic paper. It has been found that the effect of orientation is to decrease the surface resistivity of the resin composition from 10^{14} to 10^{11} Ω even if the same high-molecular weight permanent antistatic agent is used as shown in Comparative Examples 2 and 3 of the present application (Table 2). Thus, the effect of orientation on the antistat effect has been made obvious for the first time from the present application.

3) Comparison with Takashi et al.: US Patents 4,075,050 and 4,318,950 concern a synthetic paper obtained by laminating on both surfaces of a base layer of biaxially oriented thermoplastic resin a thermoplastic resin film obtained by uniaxially orienting a thermplastic resin having an inorganic filler incorporated therein and process for the preparation thereof. These US patents disclose the incorporation of a low-molecular weight antistatic agent in the paper-like (surface) layer and base layer. However, the amount

of the low-molecular weight antistatic agent to be incorporated is only from 0.1 to 1.0 parts by weight. In the present application, on the contrary, the amount of the high-molecular weight permanent antistatic agent to be incorporated is as much as from 5 to 40% by weight based on the weight of the resin component. Taking a Declaration evidence as in the attached paper, we submit the results of surface resistivity and offset printability before and after rinsing from a duplicate experiment on the material of Takashi et al. comprising a low-molecular weight antistatic agent incorporated therein. The results show if the amount of the low-molecular weight antistatic agent to be incorporated is small as in Takashi et al.'s invention (0.3 parts as shown in Experiment Example 2 of Takashi et al.), the resulting effect of improving the antistat effect is small, deteriorating the feedability and dischargeability of paper during offset printing. If the low-molecular weight antistatic agent is incorporated in a large amount as in the present application (16.7 parts by weight based on the weight of the resin component according to Example 1 of the present application), the film becomes sticky to the molding roll during molding and thus can be hardly molded. When washed with water, the film thus obtained undergoes elution of the antistatic agent from the surface layer to show a drastic increase of surface resistivity, i.e., from 10^{11} to 10^{15} Ω, losing its antistat effect. It can be also shown that the resulting paper exhibits a deteriorated feedability and dischargeability during offset printing.

4) As mentioned above, the present application has a

constitution different from these references and hence gives effects quite different from these references.

Duplicate experiment

Experiment 1

A duplicate experiment was made on Example 2 of US Patent 4,318,950 (invention made by the parent company of Oji-Yuka Synthetic Paper Co., Ltd., which is one of the present applicants (This technique has been transferred to Oji-Yuka Synthetic Paper Co., Ltd.)).

A resin composition (A) comprising 90 parts by weight of NOVATEC PP MA-8 (polypropylene produced by Japan Polychem Corporation; melting point: 164°C), 10 parts by weight of NOVATEC HD HJ580 (high density polyethylene produced by Japan Polychem Corporation; melting point: 134°C), 5 parts by weight of clay having a particle diameter of 1 μm produced by ENGELHARD MINERALS & CHEMICALS CO., 1.0 parts by weight of calcium stearate as a stabilizer, 0.1 parts by weight of TPANOL (1,3,5-tris(2-methyl-4-hydroxy-5-t-butyl phenol)butane)), 0.3 parts by weight of NYMEEN S-210 (dispersant produced by NOF Corp.) and 0.3 parts by weight of PHOSPHANOL RL-210 (revised name of "PHOSPHANOL SM-1", produced by TOHO Chemical Inc.) as a low-molecular weight antistatic agent was melt-kneaded through an extruder, and then extruded through a die into a sheet at a temperature of 250°C. The sheet thus formed was then cooled to a temperature of about 50°C.

Subsequently, the sheet was heated to a temperature of about 140°C where it was then longitudinally oriented by a factor of 2 utilizing the difference in circumferential speed

between rolls to obtain a longitudinally-oriented film. Separately, a resin composition (B) comprising 80 parts by weight of NOVATEC PP MA-8 (polypropylene produced by Japan Polychem Corporation; melting point: 165°C), 20 parts by weight of NOVATEC HD HJ580 (high density polyethylene produced by Japan Polychem Corporation; melting point: 134°C), 5 parts by weight of clay having a particle diameter of 1 μm produced by ENGELHARD MINERALS & CHEMICALS CO., 1.0 parts by weight of calcium stearate as a stabilizer, 0.1 parts by weight of TPANOL (1,3,5-tris(2-methyl-4-hydroxy-5-t-butyl phenol)butane)), 0.3 parts by weight of NYMEEN S-210 (dispersant produced by NOF Corp.) and 1.0 parts by weight of PHOSPHANOL RL-210 (revised name of "PHOSPHANOL SM-1", produced by TOHO Chemical Inc.) as a low-molecular weight antistatic agent was separately melt-kneaded through two extruders, and then extruded through a die onto the respective surface of the foregoing longitudinally-oriented film to obtain a paper-like layer (B)/base layer (A)/paper-like layer (B).

The three-layer film (B/A/B) was introduced into a tenter oven where it was then heated to a temperature of 160°C. The film was then oriented crosswise by a factor or 5 at a temperature of 150°C using the tenter. Subsequently, the film was thermally set at a temperature of 140°C. The film was subjected to corona discharge treatment at 70 W/m^2/min on the paper-like layer (B layer) side thereof, cooled to a temperature of 55°C, and then slit at the edge thereof to obtain a three-layer synthetic paper having a thickness of 170 μm (B/A/B = 60/50/60 μm). The synthetic paper thus obtained was a composite film comprising

a biaxially-oriented base layer and two uniaxially-oriented paper-like layers (surface layers).

Experiment 2

A uniaxially-oriented paper was prepared in the same manner as in Example 1 of the present application except that as PHOSPHANOL SM-1 to be used as an antistatic agent there was used PHOSPHANOL RL-210 (produced by TOHO Chemical Inc.) and the incorporation of the resin component in the surface layer was effected as set forth in Table 2. During the preparation of the synthetic paper, the resin became sticky to the molding roll at the molding step. Thus, the resin could be hardly molded.

Table 3 shows the results of the evaluation of surface resistivity and offset printability of the synthetic papers obtained by Experiments 1 and 2 according to the method described in the present application.

Referring to surface resistivity, Experiment 1 (low-molecular weight antistatic agent content: 0.3 parts) shows some improvement ($6 \times 10^{13}\ \Omega$) before rinsing but shows deterioration ($6 \times 10^{15}\ \Omega$) after rinsing.

Experiment 2 (low-molecular weight antistatic agent content: 16.7 parts) shows a surface resistivity as high as $4 \times 10^{11}\ \Omega$ before rinsing but shows a drastic deterioration ($5 \times 10^{15}\ \Omega$) after rinsing. This is presumably because the low-molecular weight antistatic agent elutes out of the surface of the film during rinsing.

Referring to adhesion of ink, both Experiments 1 and 2 are evaluated fair and thus are practically unacceptable.

Referring to feedability and dischargeability, both

Experiments 1 and 2 are evaluated poor and liable to frequent troubles in feed and discharge. Thus, Experiments 1 and 2 are practically unacceptable.

Table 1

	Components: Paper-like layer									
	Resin	Parts	Filler	Parts	Stabilizer	Parts	Anti-static agent	Parts	Dispers-ing agent	Parts
Ex.1	PP*1	80	clay	5	Ca-stearate	1.0	PHOS-PHANOL SM-1	0.3	NYMEEN S-210	1.0
	PE	20			TOPANOL	0.1				
	Components: Base layer									
	Resin	Parts	Filler	Parts	Stabilizer	Parts	Anti-static agent	Parts	Dispers-ing agent	Parts
Ex.1	PP*2	90	clay	5	Ca-stearate	1.0	PHOS-PHANOL SM-1	0.3	NYMEEN S-210	0.3
	PE	10			TOPANOL	0.1				

PP*1: NOVATEC PP, MA-3, polypropylene produced by Japan Polychem Corporation (melting point: 165°C)

PP*2: NOVATEC PP, MA-8, polypropylene produced by Japan Polychem Corporation (melting point: 164°C)

PE: NOVATEC HD, HJ580, high density polyethylene produced by Japan Polychem Corporation (melting point: 134°C)

clay: clay having a particle diameter of 1 μm produced by ENGELHARD MINERALS & CHEMICALS CO.

PHOSPHANOL SM-1: PHOSPHANOL RL-210 (revised name of PHOSPHANOL SM-1), produced by TOHO Chemical, was used.

NYMEEN S-210: produced by NOF Corp.

Table 2

	Final composition of surface layer					Molding/stretching/surface treatment			
	Resins (100 parts)			Fine inorganic particles (E)		Thickness (μm)	Stretching of surface layer		
	PP		Modified PP (D1)	$CaCO_3$	TiO_2	front/core/back	Uni- or biaxial stretching	Stretching ratio	Surface treatment
Ex.1	Blended amount is set forth in Table 1					60/50/60	uniaxial	5	corona
Ex.2	72.3	16.7	5.5	72.7	9.1	20/60/20	uniaxial	8	corona

Table 3

	Evaluation			
	Surface resistivity		Offset printability	
	(a)	(b)	Ink adhesion	Suitability for paper feed/discharge
Ex. 1	6×10^{13}	6×10^{15}	Fair	Poor
Ex. 2	4×10^{11}	5×10^{15}	Fair	Poor